IV. Hazardous Materials

A. Policy and Compliance

The Chief Scientist is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and a chemical hygiene plan. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per FEC 07, the scientific party will include with their project instructions and provide to the CO of the respective ship 60 to 90 days before departure:

• A list of hazardous materials by name and anticipated quantity

• Include a chemical spill plan the addresses all of the chemicals the program is bringing aboard. This shall include:

♣ Procedures on how the spilled chemicals will be contained and cleaned up.

♣ A complete inventory (including volumes/amounts) of the chemical spill supplies and equipment brought aboard by the program. This must be sufficient to clean and neutralize all of the chemicals brought aboard by the program.

♣ A list of the trained personnel that will be accompanying the project and the training they've completed.

Common Name of Material	Qty	Notes	Trained Individual	Spill control
Ethyl alcohol (95%)	80L (in 20L cans)	UN1170, Waste contained and disposed of by SWFSC at end of project. Stored in hazmat locker	Amy Hays	F
Formaldehyde solution (37%)	20L	UN1198, No waste, Stored in wet lab	Amy Hays	F
Tris buffer	500ml	Stored in wet lab	Amy Hays	F
Sodium borate powder	500gr	Stored in wet lab	Amy Hays	F
HCL (1.2N)	4L	UN1789, No waste, Stored in Radiation van on aft deck	David Wolgast	A
Sulfuric acid (10 Normal)	4L	Stored in Chem lab, waste neutralized by base in assay	David Wolgast	A
Acetone (90%)	7L	UN1090, Waste contained and disposed of by SIO at end of project, Stored in Rad van	David Wolgast	F
Manganous Chloride	4L	No waste, stored in wet lab	David Wolgast	A
Sodium Hydroxide/Sodium Iodide	4L	UN1824, Waste neutralized by acid in assay, Stored wet lab	David Wolgast	A

Ethanol (95%)	1L	UN1170, No waste, Stored in Constant temperature room	David Wolgast	F
Ecolume Scintillation Fluid	2.5L	No waste, Stored in Rad van	David Wolgast	F
14C Sodium Bicarbonate (5.0mCi)	20ml	Waste contained and disposed of by SIO at end of project, UCSD EH&S, Stored in Rad van	David Wolgast	2nd containment
HCL (12N)	150ml	No waste, Stored in wet lab/Dropper bottles with secondary containment	Shonna Dovel	A
Isopropyl Alcohol (91%)	30ml	No waste, Stored in wet lab/Dropper bottles with secondary containment	Shonna Dovel	A
Liquid Nitrogen	50L Dewar	No waste, Stored wet lab	Shonna Dovel	A
Acetone (90%)	7L	No waste, Stored in wet lab and freezer with secondary containment	Shonna Dovel	F
HCL (1N)	400ml	No waste, Stored in wet lab/Dropper bottles with secondary containment	Shonna Dovel	A
0.01 mg/ml DAPI 4',6-Diamidino-2-Phenylindole,Dihydrochloride	4x1-ml aliquots	Stored in Chem lab. Concentrated DAPI in freezer with secondary containment	Shonna Dovel	A
Buffered Formalin (10%)	2L	Stored in Chem lab fume hood with secondary containment	Shonna Dovel	F
Alkaline Lugol's fixative (100%)	250ml	Stored in Chem lab refer with secondary containment	Shonna Dovel	F
Paraformaldehyde (10%)	.5L	Stored in Chem lab refer with secondary containment	Shonna Dovel	F
Proflavin (0.033%)	250ml	Stored in Chem lab refer with secondary containment	Shonna Dovel	F
Sodium Thiosulfate (0.190M)	250ml	Stored in Chem lab refer with secondary containment	Shonna Dovel	F

Basic Lugol's fixative (100%)	500ml	Stored in Chem lab fume hood with secondary containment	Shonna Dovel	F
Ammonium Molybdate	75g	No waste, Stored in Chem lab	Dan Schuller	D
Ammonium Sulfate	0.1322g	No waste, Stored in Chem lab	Dan Schuller	D
Ascorbic acid	46g	No waste, Stored in Chem lab	Dan Schuller	D
Brij-35 (15%)	15g	No waste, Stored in Chem lab	Dan Schuller	D
Imidazole	8g	No waste, Stored in Chem lab	Dan Schuller	D
Copper Sulfate	2g	No waste, Stored in Chem lab	Dan Schuller	D
N-(1-naphthyl) ethylenediamine dihydrochloride	2g	No waste, Stored in Chem lab	Dan Schuller	D
Cadmium Coil	3g	No waste, Stored in Chem lab	Dan Schuller	D
Oxalic acid	100g	No waste, Stored in Chem lab	Dan Schuller	D
Sodium dodecyl sulfate	24g	No waste, Stored in Chem lab	Dan Schuller	A
Potassium antimony tartrate	0.34g	No waste, Stored in Chem lab	Dan Schuller	D
Potassium Phosphate	0.8g	No waste, Stored in Chem lab	Dan Schuller	D
Sodium chloride	850g	No waste, Stored in Chem lab	Dan Schuller	D
Sodium Nitrite	1.4g	No waste, Stored in Chem lab	Dan Schuller	D
Sodium hydrogen carbonate	15g	No waste, Stored in Chem lab	Dan Schuller	D
Sodium Hydroxide	10g	No waste, Stored in Chem lab	Dan Schuller	D
Sodium Hydroxide	0.1L	No waste, Stored in Chem lab	Dan Schuller	A
Ammonia Sulphate	1L	No waste, Stored in Chem lab	Dan Schuller	A
Sodium sulfite	2.4g	No waste, Stored in Chem lab	Dan Schuller	D
Sulfanilamide	20g	No waste, Stored in Chem lab	Dan Schuller	D
O-phthalaldehyde	4g	No waste, Stored in Chem lab	Dan Schuller	D
Ethanol	1500ml	No waste, Stored in Chem lab	Dan Schuller	F
HCL (dilute 1.2N)	2.5L	No waste, Stored in Chem lab	Dan Schuller	A
HCL (conc. 12N)	4L	No waste, Stored in Chem lab	Dan Schuller	A

SPILL CONTROL

A: ACID/Bases

• Wear appropriate protective equipment and clothing during clean-up. Keep upwind. Keep out of low areas.

• Ventilate closed spaces before entering them.

• Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

• Large Spills: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

• Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

• Never return spills in original containers for re-use.

• Neutralize spill area and washings with soda ash or lime. Collect in a non-combustible container for prompt disposal.

• J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

F: Formalin/Formaldehyde/Ethanol/Acetone

• Ventilate area of leak or spill. Remove all sources of ignition.

• Wear appropriate personal protective equipment.

• Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible.

• Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container.

• Do not use combustible materials, such as saw dust.

Inventory of Spill Kit supplies

Product Name	Amount	Chemicals it is useful against	Amount it can clean up
Chemical Spill pads	100	Formaldehyde, Alcohols	29 gallons
Formaldehyde Eater	5 gal	Formaldehyde	10 gallons

**Note: Please see attached Appendix 1.a. detailing spill control efforts for Scripps Institution of Oceanography.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

• An inventory list showing actual amount of hazardous material brought aboard

• An MSDS for each material

• Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program.

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory of hazardous material indicating all materials have been used or removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials.

MSDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of scientific chemicals is not permitted during projects aboard NOAA ships.

B. Radioactive Isotopes

The Chief Scientist is responsible for complying with OMAO 0701-10 Radioactive Material aboard NOAA Ships. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

At least three months in advance of a domestic project and eight months in advance of a foreign project start date the shall submit required documentation to MOC-CO, including:

1. NOAA Form 57-07-02, Request to Use Radioactive Material aboard a NOAA Ship

2. Draft Project Instructions

3. Nuclear Regulatory Commission (NRC) Materials License (NRC Form 374) or a state license for each state the ship will operate in with RAM on board the ship.

4. Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters (NRC Form 241), if only state license(s) are submitted).

5. MSDS

6. Experiment or usage protocols, including spill cleanup procedures.

Scientific parties will follow responsibilities as outlined in the procedure, including requirements for storage and use, routine wipe tests, signage, and material disposal as outline in OMAO 0701-10.

All radioisotope work will be conducted by NRC or State licensed investigators only, and copies of these licenses shall be provided per OMAO 0701-10 at least three months prior to the start date of domestic projects and eight months in advance of foreign project start dates.

C. Inventory (itemized) of Radioactive Materials

Common Name Radioactive Material	Concentration	Amount	Notes
14C Sodium Bicarbonate	5.0mCi	20ml	To be used and stored in Science provided Rad van on main deck of ship. All waste contained and offloaded on or about April 15 by UCSD,EH&S